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Quality

## WATER QUALITY REPORT



## “Water – USE IT Wisely”

Durham’s water customers responded to the voluntary conservation measures during December; now staff members want customers to dive into wise water use year round. The national average for water consumption is 75 gallons per person per day. In 2001 Durham’s customers used 77.7 gallons per person per day (gppd). This is down almost 5% from the previous year when customers used 81.5 gppd. By implementing the measures and habits below, we can cut usage even more – which extends our water supply. Here are some tips on using water wisely – and it all starts with YOU – our customers.

### ► OUTDOOR WATER TIPS:

- Water your lawn only when it needs it, and only before 10:00 a.m. or after 6:00 p.m.
- Make sure that sprinklers are watering only the landscape, not the driveway and street.
- Clean drives, sidewalks and decks using a broom or leaf blower.
- Plant drought tolerant and/or native trees and plants.
- Make sure to use mulch to help retain moisture.
- Always use an automatic shut-off nozzle on your water hose.

### ► INDOOR WATER HINTS:

- Repair all leaks and drips.
- Install low flow showerheads and faucet aerators.
- Limit shower time to 5 minutes.
- Install a new 1.6-gallon per flush toilet.
- Make sure to wash only full loads in dishwashers and clothes washers and adjust water levels whenever possible.
- Catch water from washing vegetables and fruits and use to water houseplants.
- Turn off the faucet when shaving or brushing your teeth.

**FOR MORE HELPFUL HINTS**, information on how to repair toilet and faucet leaks, and a consumer guide to 1.6 gallon per flush toilets, visit the Water Conservation pages on the City’s website at [www.ci.durham.nc.us/departments/envirom/tips.asp](http://www.ci.durham.nc.us/departments/envirom/tips.asp). Or call Conservation staff at 560-4381 to request the “Resourceful Landscapes” brochure or a presentation on Water Smart Gardening...and remember – it all starts with you!

## citizen INVOLVEMENT

How can you be involved in decisions regarding Durham’s water system or other City issues? Citizens are welcome to attend regularly scheduled meetings of Durham’s City Council. Council meetings are the first and third Monday of each month at 7:00 p.m. City Council members also have regular work sessions to prepare for Council meetings. These sessions occur on Thursdays - two weeks prior to each regular business (Council) meeting - at 1:00 p.m. in the Council’s Committee Room on the second floor of City Hall. Council meetings are held at City Hall in the Council Chambers on the first floor. Check the City’s website to confirm meetings @ [www.ci.durham.nc.us](http://www.ci.durham.nc.us). City Hall is located in downtown Durham at 101 City Hall Plaza.



*Little water droplets from E.K. Powe Elementary rode on the Environmental Resources 2001 Holiday Parade float.*

### EN ESPAÑOL

Este folleto tiene informacion importante acerca de la calidad del agua que provee la Ciudad de Durham. Si necesita mayor informacion acerca del contenido de este folleto el personal del Centro Hispano, 201 W. Main Street, Suite 100, tele fono, (919) 687-4635 puede ayudarlo.

During 2001 Durham delivered an average of 32.4 million gallons of water per day to approximately 175,000 people in Durham City and County.

# Rising to the Challenge

Top quality drinking water...Treatment plant renovations and upgrades...New environmental programs...And returning to limited use of Durham's first water source during a record dry spell. Those are just of the few highlights included in this fifth edition of **Tap into Quality**, the City's Water Quality Report for 2001. The City of Durham Environmental Resources Department is pleased to provide its customers this annual report as required by the federal Safe Drinking Water Act Amendments (1996). You'll be happy to learn that the City of Durham, through its well-maintained water system, professional staff and quality programs, continues to rise to the challenge of delivering an adequate supply of clean, safe water to your tap.

## CITY, CITIZENS WEATHER RECORD DROUGHT

During the last 90 days of 2001 Durham received only 1.76 total inches of rainfall. That's less than 20% of the usual precipitation! Lake Michie and Little River Lake, Durham's water sources, reached record low levels: 21.2 feet and 28.1 feet respectively below full.

As a result, in early December 2001 the City of Durham enacted Stage II - Voluntary Water Conservation of the Water Conservation Ordinance. Environmental Resources staff sought additional water sources to supplement Lake Michie and Little River Lake. Plant Engineering



*Little River December 2001*

& Maintenance staff re-commissioned an existing emergency water pumping station built on the Eno River in the late 1980s. Since December 13, 2001 approximately 4 million gallons per day have been pumped from the Eno River to supplement Durham's water sources.

Thanks to customer cooperation, the City reduced demand on the water system by approximately 5%.

## HEIGHTENED PLANT SECURITY

In response to the events of September 11, 2001 the City of Durham took additional precautions to safeguard local government buildings and facilities. In addition to keeping gates at supply and treatment facilities closed at all times, further measures were put into place. Experts within the City's Police Department have helped to identify potential vulnerable areas. Security improvements will continue through the next fiscal year. While citizens should be assured that staff members are taking every possible precaution to maintain the security of our system, we encourage reporting any suspicious activity.

## INCREASED FILTRATION AT BROWN TREATMENT PLANT

In May 2001 the State's Department of Environment and Natural Resources, Public Water Supply (PWS) section verbally approved Durham's request to increase the filtration rate at the Brown Water Treatment Plant. Durham's newer treatment plant, located at 1615 Infinity Road, was previously rated to treat 30 MGD. This approval allows the plant to filter water through one portion of the plant at a 6-gallon per minute/square foot rate. Using this strategy, the Brown Water Treatment Plant can now process up to 39 million gallons of water per day (MGD), an increase of 9 MGD. Data compiled by City staff during a yearlong study at the Water Supply & Treatment's Pilot Plant verified that Durham's drinking water would continue to meet all state and federal standards using the new filtration rate. Permission to treat at this rate is provisional; the state requires that the City promote water conservation measures while functioning in the "high-rate" mode. Typically, this rate would be used during summer when outdoor water use increases demand by almost 40%. The City's Conservation staff provide guidelines on efficient outdoor and indoor water use year round.

## FACILITY CONSTRUCTION AND UPGRADES

Renovations and upgrades continued throughout 2001 at the Williams Water Treatment Plant (1405 Hillandale Road). In addition to restoring the oldest treatment plant to its red brick beauty, structural additions at the plant were designed to adhere to the same classic architectural style. New equipment has been added to accommodate changes in the treatment process. During 2001, Durham switched from using chlorine gas as a disinfectant to using liquid chlorine in the form of sodium hypochlorite. Other additions have included installing ammonia feed equipment in preparation for the change to chloramines as a disinfectant in early 2002. The same process changes are being made at the Brown Water Treatment Plant on Infinity Road. Plans for 2002 also include using ferric chloride in the treatment process to further reduce the formation of disinfection by-products.

## COMMUNITY PARTICIPATION – A NEAT IDEA!

Neighbors can promote community action and resolve local environmental issues/problems by participating in the City's new NEAT program. NEAT stands for Neighborhood Environmental Action Team and is Durham's Eco-Neighborhood award program. The program is a joint venture of the City's Environmental Resources, Public Works, and Solid Waste Management Departments that encourages collective environmental stewardship and community pride. NEAT has FOUR education/action components: stormwater runoff/stream health, water conservation, proper grease disposal, and recycling/waste reduction.

Who can participate and how? Any neighborhood with at least 10 interested households and one or more willing leader(s) can join. Each participating team is expected to complete at least one major activity per year in each of the four education/action categories. NEAT leaders serve as liaisons between City departmental staff and the neighborhoods.

What's in it for you? A more environmentally friendly neighborhood, community pride and unity, free environmental consultation/audits for all participating households and **MORE!** Check out NEAT charter neighborhoods – Watts Hospital-Hillandale and Eno Commons – on the NEAT webpage at [www.ci.durham.nc.us/departments/neat](http://www.ci.durham.nc.us/departments/neat). For more NEAT information, call 560-4381 or visit the NEAT web page.



## 2001 CONSERVATION POSTER CONTEST FOR AREA CHILDREN



Winners were chosen in each of three grade levels: K – 2, 3 – 5 and 6 – 8. Local winning entries were also entered into a statewide contest. Each year since the contest began, at least one Durham child has won at the state level. The elementary school theme for 2001 was “Every Day is a Water Smart Day – at Home, at School, at Work, at Play” with winning entries for Grades K – 2, all from E.K. Powe Elementary; **Avi Stein** (1st place), **Zhongshan Zhu** (2nd place) and **Erick Torrijos** (3rd place). Grade 3 – 5 winners were: **Sarah Newton** (4th grade, Eno Valley School), **Rosa Jones** (4th grade, Glenn School), **Scott Atwater** (5th grade, CC Spaulding ) and **Karen Hernandez** (Honorable Mention, Glenn School). Middle School entries had the theme of “World Wide Water: Safe Water for All”. Winning entries were: **Amanda Wickline**, picture above, (8th grade, Chewning MS), **Kimi Finch** (6th grade, Carrington MS), **Meredith Parks** (6th grade, Carrington MS) and **Bridget McCaskill** (6th grade, Carrington MS). **Sarah Newton** won first place (3 – 5 ) at the state level while **Kimi Finch** and **Rosa Jones** were recognized by winning second place in their respective grade levels statewide.



*City chemists and lab analysts process thousands of samples each year to make sure Durham's water meets state and federal guidelines.*



## Special Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

### CRYPTOSPORIDIUM:

This microscopic organism is a relatively new concern for water providers. When ingested, Cryptosporidium can cause fever, diarrhea, and other gastrointestinal symptoms. Crypto occurs naturally in rivers and lakes and comes from animal wastes. Controlling and minimizing development and animal activities in our watershed reduces the occurrence of Crypto in raw water. The treatment combination of filtration, sedimentation and disinfection effectively eliminates Crypto from the drinking water. As part of the Information Collection Rule, Durham has monitored both supply lakes on a monthly basis since July of 1997. Crypto has never been detected in Durham's treated drinking water.

EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial organisms are available from the Safe Drinking Water Hotline (800-426-4791).

**QUESTIONS REGARDING THE INFORMATION IN THIS REPORT** should be directed to Environmental Resources Department staff at the Brown Water Treatment Plant at 560-4362. For information on water conservation or to arrange a tour of facilities, call 560-4381. Call Customer & Billing Services at 560-4411 for all billing questions. For additional information about City operations and services, contact the City's Customer Service and Information Center at 560-4480.

▼ KEY TO ABBREVIATIONS IN TABLE

mg/L	Milligram per liter, or parts per million.	AL	Action Level; the concentration of a contaminant that triggers treatment or other requirements that a water system must follow. Action Levels are reported at the 90th percentile for homes at greatest risk.	pCi/L	Picocuries per liter is a measure of the radioactivity in water.
MCL	Maximum Contaminant Level; the highest level of a contaminant that is allowed in drinking water.	TT	Treatment Technique; a required process intended to reduce the level of a contaminant in drinking water	NTU	Nephelometric Turbidity Units; measures the cloudiness in water
MCLG	Maximum Contaminant Level Goal; the level of a contaminant in drinking water below which there is no known or expected risk to health.	µg/L	Micrograms per liter, or parts per billion	ND	Not Detected
				NR	Not Regulated
				<	Less Than
				N/A	Not Applicable

## 2001 WATER QUALITY SUMMARY

Substance & Unit of Measurement	Max. Level Detected and Range	Max. Level Allowed MCL	Ideal Goal (MCLG)	Potential Source(s) of Substance	Reason(s) for Regulating Substance
REGULATED AT THE TREATMENT PLANTS					
<b>Fluoride</b> mg/L	1.07 (< 0.79 - 1.07)	4.0	4.0	Naturally occurring mineral; also added to promote dental health	Some people who drink water containing fluoride in excess of the MCL over many years may get bone disease. Children may get mottled teeth.
<b>Nitrate</b> mg/L (as Nitrogen)	0.30 (< 0.10 - 0.30)	10.0	10.0	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
<b>Turbidity</b> NTU	0.15 (0.10 - 0.15)	TT	N/A	Soil runoff	Turbidity has no health effect; however, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms.
<b>Alpha emitters</b> pCi/L*	0.54 no range	15	0	Emission of alpha radiation as a result of the erosion of natural deposits	Some people who drink water with alpha emitters in excess of the MCL over many years may have an increased risk of cancer.
<b>Beta/photon emitters</b> pCi/L*	2.80 no range	50**	0	Emission of photons and beta radiation as a result of the decay of natural and man-made deposits	Some people who drink water with beta/photon emitters in excess of the MCL over many years may have an increased risk of cancer.
REGULATED AT THE CUSTOMER'S TAP					
<b>Copper</b> mg/L ***	0.10 (90th percentile)	AL=1.3	1.3	Corrosion of household plumbing systems None of the targeted 103 sampling sites exceeded the Action Level	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Long term exposure can cause liver or kidney damage.
<b>Lead</b> µg/L ***	ND < 5 (90th percentile)	AL=15	0	Corrosion of household plumbing systems 2 out of 103 targeted sampling sites exceeded the Action Level	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Adults who drink this water over many years could develop kidney problems or high blood pressure.
REGULATED IN THE DISTRIBUTION SYSTEM					
<b>Total Coliform Bacteria</b> (as a percent)	0	< 5% positive	0	Human and animal fecal waste; indigenous sources such as vegetation; bacterial regrowth	Coliforms are used as an indicator that other, potentially-harmful bacteria may be present.
<b>Total Trihalomethanes</b> µg/L (TTHM)	84.8 System average (25.0 - 157.0)	100	0	By-product of drinking water disinfection	Some people who drink water with TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of cancer.

UNREGULATED SUBSTANCES					
<b>Chlorodibromomethane</b> µg/L	<b>2.0</b> ( $< 0.5 - 2.0$ )	NR	NR	Component of TTHMs	<div>NOTE:</div> <div>See above for regulating TTHMs above in the Total Trihalomethanes section.</div>
<b>Chloroform</b> µg/L	<b>141</b> (18 – 141)	NR	NR	Component of TTHMs	
<b>Bromodichloromethane</b> µg/L	<b>18.0</b> (5 – 18.0)	NR	NR	Component of TTHMs	
<b>Haloacetic Acids</b> µg/L (HAAs)	<b>46.3</b> System average (9.1 – 77.0)	NR	N/A	By-product of drinking water disinfection	Some people who drink water containing HAAs in excess of the MCL over many years may have an increased risk of cancer.
<b>Sodium</b> mg/L	<b>20.1</b> (6.2 – 20.1)	NR	20 [Proposed]	Naturally occurring element in soil and water	Sodium is an essential nutrient, however, consuming high levels of sodium can contribute to high blood pressure.
<b>Sulfate</b> mg/L	<b>36</b> (19 – 36)	NR	500 [Proposed]	Naturally occurring mineral in soil	Sulfate may have a laxative effect for some people who drink water containing high levels of sulfate.
<b>Total Organic Carbon (TOC)</b> mg/l Results show the range of TOC in both source and treated water. Durham's treatment processes remove significantly more than the required 50%.	Source 12.0 (5.4 - 12.0) Treated <b>4.9 (2.2 - 4.9)</b> Average removal 56%	NR	TT 50% removal	Naturally present in the environment	Total organic carbon (TOC) has no health effect; however, TOC provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of cancer.
*Samples were collected and analyzed July 2000.    **EPA considers 50 pCi/L to be the level of concern for beta particles.    *** Sampling and analysis conducted every three years. Sampling conducted in September 2001.					

### ▲ PHYSICAL AND MINERAL CHARACTERISTICS

SUBSTANCE, UNIT OF MEASUREMENT	ANNUAL AVERAGE
pH, standard units - range	7.0 – 7.2
Alkalinity, mg/L	24
Aluminum, mg/L	$< 0.05$
Calcium, mg/L	11.3
Chloride, mg/L	10.2
Conductivity, micromhos/cm	142
Hardness - Calculated, mg/L	37
Hardness - EDTA, mg/L	41
Orthophosphate, mg/L (as phosphorus)	0.27
Potassium, mg/L	2.1
Total Solids, mg/L	87
Zinc, mg/L	0.27



# Tip-Top Tap Water

The City of Durham Environmental Resources Department is pleased to report that the water from your tap continues to comply with all state and federal requirements for drinking water. On the right you will see a table showing that Durham's tap water had zero violations of any standards during the 2001 calendar year. The substances which were detected were all well below the levels allowed by the Environmental Protection Agency (EPA).

## DURHAM'S WATER SOURCES

The sources of drinking water - both tap and bottled - include rivers, lakes, streams, ponds, reservoirs, springs and wells. Durham is fortunate to have two high quality sources of raw (untreated) water. Lake Michie, built in 1926, has provided Durham with a reliable supply of approximately 19 million gallons per day (MGD) for over sixty years. Rapid development in the mid 1980s prompted the construction of the Little River Reservoir and Dam which was completed in 1988, providing an additional 18 MGD of water for a combined safe yield of 37 MGD. In addition to having two water supplies, Durham also has two water treatment plants, the Williams Water Treatment Plant (located on Hillandale Road) and the Brown Water Treatment Plant (located on Infinity Road). Water can be transferred from the two supply lakes to the two treatment plants by gravity flow, hydro-power or electric power. On-site terminal reservoirs at each of the water treatment plants hold a two to three day supply of raw water. During 2001, due to extremely dry conditions contributing to low lake levels, Durham began supplementing our water supply with approximately 4 million gallons per day from the Eno River. The City plans to continue to use the Eno as a supplemental supply until both Little River Lake and Lake Michie are full. Water taken from the Eno is blended with water from Lake Michie and is ultimately treated at the Williams Water Treatment Plant.



## HOW IS DURHAM'S WATER TREATED?

Both the Williams Water Treatment Plant (built in 1927, current capacity of 22 MGD) and the Brown Water Treatment Plant (built in 1977, current capacity of 39 MGD) operate using optimized conventional water treatment processes. At the water treatment facilities, raw water is mixed with lime to adjust the pH and alum to coagulate particles. After mixing, the water flows into settling basins where the particles clump together (coagulation), become heavy and settle to the bottom of the basins (flocculation). After disinfection, the clearer water flows through filters, which remove the remaining particles. Fluoride is then added prior to distribution to our customers.

## HOW DOES WATER TRAVEL?

As water travels over the surface of the land or through the ground, minerals and other materials are dissolved naturally. Water can also pick up substances that are the result of animal or human activity. Source water may contain microbial contaminants such as viruses and bacteria; inorganic contaminants such as salts and metals; pesticides and herbicides from agriculture or urban run-off; organic chemicals from industrial processes or run-off; and radioactive contaminants which can be naturally occurring.

## WHAT CAN YOU EXPECT OF DRINKING WATER?

In order to ensure that tap water is safe to drink, the EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration establishes regulations for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health

